May 2020

OfficeHours_IS4_20150914_Seg02.pdf

Setting: in the corner of a room. IS4 is helping S1 with matrix questions
Participants: S1 is the boy in pink. IS4 is the boy in dark gray

0:00
Xxx S1: I just have a couple of questions from the homework.
Xxx um:=
Xxx IS4: =the homework is due:-
Xxx S1: uh:
Xxx Wednesday.
Xxx IS4: Wednesday.
Xxx S1: I mean I- I understand ((unclear)) so I'm not lost
Xxx like I was with the (mark off chain).
Xxx um:
Xxx trying to find the page.
Xxx one second.
Xxx [page 90
Xxx IS4: [mark off chain is pass now
Xxx S1: this is now the-
Xxx IS4: (chromosome) matrix.
Xxx S1: matrix yea.
Xxx S1: ((unclear)) one second.
0:40
Xxx S1: so this is the first page.
Xxx [I know this-
Xxx IS4: [96 ((flips pages))
Xxx so it's fine.
Xxx S1: ((unclear)) I'm good.=
Xxx IS4: =ok
Xxx S1: starting on starting the next part.
Xxx (so I turned it into)-
xxx it's got the x and y and this-
Xxx so I know this is its own matrix.
Xxx this can be it's own matrix
xxx right?=
Xxx IS4: =yea
Xxx S1: and then do I create this,
Xxx this- this is-
Xxx IS4: you can('t).

xxx um:-
Xxx you know what uh:-
Xxx when you write this system
Xxx of equations
xxx in matrix form.
Xxx so you should-
Xxx you should write the three ((unclear)) in the column
Xxx (column).
Xxx S1: so- so- so I'm gonna add the X 1 X 2 X 3 to this.
Xxx IS4: yea 2 3 I think-
Xxx I think this- I think this is-
Xxx S1: ((writing)) x 2 x 3
Xxx IS4: no- no- no- no-
Xxx S1: no.
Xxx IS4: you don't have to do that.
Xxx S1: I don't have to do that ok.
Xxx IS4: um now uh
Xxx ((starts looking for something))
1:52
Xxx IS4: can I use this?
Xxx S2: sure!
Xxx IS4: so um you should write the unknowns in- in this form.
Xxx X 1 X 2 X 3=
Xxx S1: =right
Xxx IS4: I think you-
Xxx S1: yea- no- <yea yea yea>
Xxx <I figure to do that but then there's also a Y>
Xxx so do I create separate matrixes?
Xxx one
Xxx so like this to be this times-
Xxx IS4: yea Y- Y you can just leave to the right side.
Xxx S1: right
Xxx IS4: you don't have to-
Xxx S1: so I'm going to do this then I'm going to do this=
Xxx IS4: =yea
Xxx S1: this is ((unclear)) X.
Xxx IS4: do not focus on the ((unclear))
Xxx just-
Xxx S1: ok so and then-
Xxx IS4: and then one you can use the same (tree).
Xxx the same (tree) like ((reaches over)).

Xxx ((but ends up looking at S1’s work))
Xxx S1: X 3
Xxx IS4: uh no no
Xxx the left side should- the left side should
Xxx [(write) ((unclear))
Xxx S1: [oh so just do it on this side
Xxx IS4: so- so- so just multiple this and this.
Xxx S1: so yea=
Xxx IS4: =yea
Xxx so this X means this column.=
Xxx S1: =no I'm just naming that matrix.
Xxx so ((starts mumbling as he writes things down))
Xxx IS4: yea (.) so you you don’t have to (.) write (this),
Xxx you can just ignore this.
Xxx it is-
Xxx this matrix times this matrix.
Xxx [so
Xxx S1: [and that equa:ls-
Xxx IS4: that equals this=
Xxx S1: =this matrix times=
Xxx IS4: =times Y 1 Y 2 Y 3=
Xxx S1: =right
Xxx IS4: and then plus this plus this column matrix
Xxx S1: right ((writes things))
Xxx IS4: oh now the- there are mistakes here.
Xxx S1: ((unclear))
Xxx IS4: ((points))
Xxx S1: oh yea that’s right
Xxx IS4: minus minus [so when there's a minus you [should add
Xxx S1: [oh [right
Xxx add
Xxx IS4: the minus side in the matrix.
Xxx S1: ((mumbles to self))
Xxx IS4: yea exactly
Xxx S1: ((mumbles to self))
Xxx IS4: no now first you should run this matrix.
Xxx S1: oh now- now (see what this matrix equal).
Xxx IS4: so
Xxx [so ((reaches over))
Xxx S1: [so so
Xxx IS4: the same method.

Xxx S1: ((mumbles to self))
4:55
Xxx IS4: yea so- so this is the left side the equation.
Xxx S1: right now I want [to do the right.
Xxx IS4: [so now you have to focus on the
Xxx right side.
Xxx S1: so right side this would be-
Xxx IS4: right side.
Xxx it is very similar to the left side.=
Xxx S1: =right
Xxx ((mumbles to self))
Xxx IS4: copy this.=
Xxx S1: =yup
Xxx IS4: divide 2 by 3
Xxx S1: ((mumbles to self))
Xxx IS4: 6 minus 4 4
Xxx S1: 4
Xxx IS4: I can- I can read you.
Xxx and 2 0 minus 2
Xxx and then you can (times) [1
Xxx S1: [1
Xxx IS4: yea
Xxx S1: ((mumbles to self))
Xxx IS4: the last term is-
Xxx S1: ((mumbles to self))
6:00
Xxx IS4: wait- wait- wait I would recommend that you uh-
Xxx you should write all the terms.=
Xxx S1: =oh ok
Xxx IS4: yea and it-
Xxx S1: so now do ((unclear))
Xxx IS4: yea
Xxx (and you need to group that because)-
Xxx S1: so now how do I do this matrix in?
Xxx IS4: you- you just write it in column.
Xxx [pa- pa- pass
Xxx S1: [just write it so so I just say T
Xxx IS4: you can plus T yea.
Xxx S1: plus T
Xxx IS4: and this T is ((looks)
Xxx (2 2 O T)=

Xxx S1: =yea
Xxx IS4: ((unclear))
Xxx this min- minus 1.
Xxx S1: oh so ((writes))
6:43
Xxx IS4: so this equals this=
Xxx S1: =plus that=
Xxx IS4: =yea
Xxx S1: ok
Xxx IS4: so you can get the equation.
Xxx S1: let's say I want to say A times Y plus C,
Xxx IS4: yea C times Y plus C.
Xxx S1: I'm gonna say B times-
Xxx IS4: B times Y.
Xxx S1: [equals T
Xxx IS4: [equals T times A X=
Xxx S1: =oh
Xxx <I can just say that I don't have to write it>.
Xxx IS4: you can just write A X so it's-
Xxx S1: [ok
Xxx IS4: [done.
Xxx S1: ok so I don't have to rewrite- redo the matrix.
Xxx IS4: yea you don't °have to.=
Xxx S1: =ok
Xxx IS4: so when when (you) do [the B part
Xxx S1: [((reads directions))
Xxx you- you should put-
Xxx uh ((unclear)) these parts.
Xxx to the left side.
Xxx S1: ok now I would [multiply A and B.
Xxx IS4: [you should put
Xxx S1: I mean A- A-
Xxx IS4: so- so you can- you can combine this matrix
Xxx and this matrix-
Xxx S1: right so (I can) multiply A and B.
Xxx IS4: yea and- and they ((unclear))
Xxx times X Y and there- there is 6 minus-
Xxx S1: oh so multiple A X by B Y.
Xxx IS4: multiply A X-
Xxx S1: multiply A X so I didn't- I didn't draw B Y.
Xxx IS4: yea

Xxx S1: °but (I should do) B Y.
Xxx: and then I just multiply A X by B Y
Xxx: and then figure.>
Xxx: so this would be like-
Xxx: this would be 5 Y.
Xxx IS4: 5 yea
Xxx S1: so this would be 10 X 1 Y 1-
Xxx IS4: <no no no>.
Xxx S1: no so-
Xxx IS4: you should write the matrix in this you know-
xxx: ((writes))
xxx: this X is this matrix.
xxx: this Y is this matrix.=
xxx S1: =right
xxx IS4: A and B are this two matrix.=
xxx S1: so
xxx IS4: it is-
xxx S1: so multiple and B-
xxx: get the numbers put them together-
xxx IS4: no you- you don't have to [multiply them.
xxx S1: [I don't have to
xxx IS4: you put them together in a matrix.
xxx S1: oh!
Xxx: oh ok so-
Xxx IS4: put together in a matrix.
Xxx S1: just like this [((speaks math))
Xxx IS4: [so it become 3 by 6
Xxx S1: right so I want to say-
Xxx IS4: 3 by 6 matrix
Xxx S1: so wanna combine this-
Xxx IS4: yea so you just write 3 minus 2
Xxx: and you just write-
Xxx S1: 3 minus 2 and I ((unclear))
Xxx IS4: you go
Xxx: you you don't finish.=
Xxx S1: =ok
Xxx IS4: and you just you go in 5 2
Xxx S1: <(oh right here)>?
Xxx IS4: yea
Xxx S1: 5 2 3
Xxx IS4: 5 minus

9:00
Xxx S1: 5 ((unclear)) negative
Xxx IS4: minus 3 ((checks))
Xxx so you-
Xxx S1: combine oh just combine the two.
Xxx IS4: combine (these two matrix).
Xxx S1: ((mumble))
Xxx 5 2 negative
Xxx there's two zeros.
Xxx IS4: yea.
Xxx and you times- times the matrix of the unknowns.
Xxx and now the unknown is 6 6.
Xxx S1: right
Xxx [((mumbles to self))
Xxx IS4: [so now you can write it X 1 X 2 X 3.
Xxx ((unclear))
Xxx you- you should write this (three) time in here.
Xxx S1: write it underneath.=
Xxx IS4: =yea
Xxx S1: oh oh don't make it two columns-
Xxx IS4: because-
Xxx S1: just the one column.=
Xxx IS4: =yea
Xxx S1: ok
Xxx IS4: so there are two columns here.
Xxx so these two columns cannot be-
Xxx cannot be modified.=
Xxx S1: =right
Xxx IS4: yea so
Xxx it is a 3- 3 by 6.
Xxx (this is) 6 by 1.=
Xxx S1: =right
Xxx IS4: so it (can be multiplied) ((Alt transcription: cannot
xxx be modified))=
Xxx S1: =right
Xxx ((writes))
Xxx IS4: and this equals (this two)
Xxx S1: oh ok and then
Xxx ((mumbles to self))
Xxx IS4: can copy this,
Xxx just copy it.

Xxx S1: ok
Xxx IS4: so
Xxx IS4: so do you know why- why do this?
Xxx S1: well no this this is <where I get confused>
Xxx ((unclear))
Xxx I didn't know about like uh-
Xxx I didn't know how to-.
Xxx which way you put it
Xxx do you in a column,
xxx or in a row.
Xxx IS4: column uh so-
Xxx S1: like why you can also-
Xxx since this could be X 1 this could be X 2 X 3=
Xxx IS4: uhuh
Xxx S1: why don't you put it this way?
Xxx and then multiply it like that?
Xxx IS4: yea so- so-
Xxx it is defined.
Xxx it is definition to (matrix) by (modification).
Xxx so you just do it.
Xxx and wha- why we get this matrix
Xxx in fact we uh-
Xxx ((flips pages))
11:27
Xxx IS4: yea because-
xxx in fact we put these three-
Xxx these three terms on the left.
Xxx you know it is uh-
Xxx sorry there was a mistake.
Xxx you should a add a minus sign,
Xxx on this line (entry).
Xxx S1: oh on the Y entry.=
Xxx IS4: =yea
Xxx because- because you
Xxx when you put this ((unclear)) left.
Xxx S1: so then [that's going to make everything negative.
Xxx IS4: [so then
Xxx yea
Xxx S1: so that would be-
Xxx IS4: be everything negative.
Xxx S1: [except for these ((unclear))

Xxx IS4: [and and minus three ((unclear))
12:00
Xxx S1: minus 4 (is what I want)
Xxx IS4: [positive to um-
Xxx S1: [is it negative
Xxx 2 0 2 0 ((unclear))
xxx IS4: yea
Xxx S1: so this becomes a positive 2.
Xxx everything else becomes negative.
Xxx IS4: everything is negative .
Xxx S1: and ((writing))
Xxx IS4: yea minus minus.
Xxx S1: no that was already negative so that stays positive.
Xxx IS4: uh ((checking)) yea yea yea
Xxx because-
Xxx when-
Xxx S1: cause you're moving it over
Xxx [to the left side of the equation.
Xxx IS4: [yea left side
Xxx so
Xxx S1: so what you should do is
Xxx really do this algebraically on paper first.
Xxx and move everything to the left side.
Xxx and make matrix out of it.
Xxx IS4: yes yes=
Xxx S1: =ok
Xxx IS4: the form the form is very clear now.=
Xxx S1: =right
Xxx IS4: it is ((unclear))=
Xxx S1: =right
Xxx ok so now ok so-
Xxx you have to multiply these out.
Xxx uh you see how this has a 4-
Xxx has a 4 limits in each row?
Xxx IS4: uhuh
Xxx S1: and this only has three?
Xxx IS4: yes
Xxx S1: how do you multiply it out?
Xxx IS4: that that doesn't matter-
Xxx because,
Xxx the most important part-

Xxx it is the three ((reading))-
Xxx oh.
Xxx S1: you have to multiply it out-
Xxx IS4: it- it doesn't even exist.
Xxx you know (if possible) so-
Xxx it isn't isn't possible.
Xxx S1: so it's impossible.
Xxx they have to have the same number right?
Xxx IS4: yea so-
Xxx S1: so- so you can't multiply these two.
Xxx [so A and B you can't do.
Xxx IS4: [yea you cannot you cannot.
Xxx S1: you can do you can do A and C.
Xxx IS4: [A and [C
Xxx S1: [because they have same number [(elements)
Xxx so I would do it this way,
Xxx so the five would go against the 1.
Xxx the 4 against the 2.
Xxx and the 1 would (against) the 3 right?
Xxx IS4: uh:
Xxx S1: ((something going down?))
Xxx IS4: no no
Xxx 1 times 5.
Xxx 2 times 1.
Xxx 3 times 3.
Xxx and 4 times 5.
Xxx S1: oh so working that way go down.
Xxx IS4: yea
Xxx S1: work this way down.
Xxx IS4: this way this way
Xxx S1: right so going across on A.
Xxx down on C.=
Xxx IS4: =yea
Xxx S1: ok so that's-
Xxx <so unless they have the same number (development)
Xxx in each row I can't do it>.=
Xxx IS4: =yea
Xxx S1: ok so that's what-
Xxx that's what I got confused wasn't sure.
Xxx IS4: you- you just remember like
Xxx ((grabs notebook))

Xxx M times M matrix.=
Xxx S1: =right
Xxx IS4: and second one
Xxx is M times M by P.
Xxx only these two are equivalent.=
Xxx S1: =right
Xxx IS4: only like only like in this condition.=
Xxx S1: =right
Xxx so that’s (the only case).
Xxx ((mumble))
Xxx so now-
xxx the same thing.
Xxx ok so this one gives you the base.
Xxx A just compute matrix.
Xxx computing matrix tells you how to-
Xxx how much each person ((unclear))
Xxx IS4: ((starts reading it himself))
Xxx S1: <so I’m gonna take that against this>.
Xxx IS4: this and this yea.
Xxx S1: this right
Xxx so then this ((reading))
Xxx so I would take that and go by this.
Xxx but I can't be because they don’t have the same-
Xxx IS4: uh: uh:
Xxx ((reading the question to self again))
15:00
Xxx yea you should (multiply) this-
Xxx S1: this-
Xxx IS4: so- so this will put in first ((unclear)).
Xxx S1: right but- but this only has two elements
Xxx this has three.
Xxx IS4: yea but that- that you see.
Xxx this this doesn’t matter.
Xxx this doesn’t matter.=
Xxx S1: =right
Xxx IS4: the only important thing is that
Xxx M equals M so
Xxx this is 2 times 2.
Xxx and this is
Xxx 2 by 3.
Xxx so we can ((unclear)).

Xxx S1: ok cause this is 2 by 2 and this is 2 by 3.
Xxx IS4: ((points))
Xxx S1: the- the this is 2 by 2 this is 2 by 3.
Xxx IS4: yea
Xxx S1: ok so I go like this-
Xxx I go like tha:t-
Xxx IS4: uhh:
Xxx 1- 1,000 times 5-
Xxx plus 500 plus.
Xxx S1: 4
Xxx times 4
Xxx S1: so- so I go across this going down.=
Xxx IS4: =yea
Xxx S1: across down.
Xxx and then same thing across down.
Xxx [across down across down
Xxx IS4: [yea
Xxx across down.
Xxx S1: and then I do this for each-
Xxx and then the last one is these two
Xxx <(multiple by each other)>.
Xxx across down.
xxx across down.
Xxx IS4: uh the- the last one should be-
Xxx S1: these two.
Xxx IS4: no no [no
Xxx S1: [huh
Xxx IS4: the this one um I think should the three-
Xxx you mu-
Xxx first uh (let me see).
Xxx ((reads))
Xxx um:
Xxx ((pause))
16:35
Xxx first you need this times this.
Xxx and and the result-
Xxx [then times this.
Xxx S1: [(this times this)
Xxx so you do this ((unclear))
Xxx ((checks phone))
Xxx ((pause))

Xxx ok! and then
Xxx IS4: so or you can ((unclear))-
Xxx S1: right first I go to these two and then-
Xxx see the result and multiple by that.
Xxx (give me the product)) ((unclear))
xxx ok and then
17:30
Xxx so: to figure out the edges of a-
Xxx [is basically (expanding trees)
Xxx IS4: [((unclear))=
Xxx S1: =yea
Xxx so its been a while since I've done this.
Xxx um:
Xxx so this mean it is-
Xxx IS4: you you didn’t catch it?
Xxx S1: this one we did last class
Xxx and I was late to last class.
Xxx IS4: o:h
Xxx S1: so
Xxx IS4: eh
Xxx did you read book?=
Xxx S1: =yea
Xxx I went through it I wen-
Xxx IS4: so so um: it can be (explained)
18:00
Xxx very simple.
Xxx so now uh
Xxx there are only 2 elements (.)
Xxx in the matrix.=
Xxx S1: =right
Xxx IS4: (zero) and one=
Xxx S1: = mhm
Xxx IS4: and if- and if it is one being like
Xxx A I J-
Xxx like A I J equals 1.
Xxx that means link between-
Xxx the no- no the number I.
Xxx and no the number J.=
Xxx S1: =mhm
Xxx IS4: so
Xxx uh now-

Xxx check- check this number.=
Xxx S1: =mhm
Xxx IS4: that means the-
Xxx there is a link between the number
Xxx 1
xxx and number 4.=
Xxx S1: =right
Xxx IS4: yea so you can ((writes))
Xxx write this
Xxx if it is 1 2 3 4
Xxx there is a link between 1 and 4
Xxx S1: [so (they're connected)
Xxx IS4: [link ((unclear))
Xxx S1: ok so-
Xxx this tells me how many vertex-
Xxx how many points to create.
Xxx IS4: um ((shakes head)) it- it-
Xxx S1: vertex.
Xxx [this is going to tell
Xxx IS4: [the the number
Xxx the number of the vertexes is
Xxx determined by the
Xxx by [the dimension.=
Xxx S1: [((unclear))
Xxx =right
Xxx [so you go down the go down the column
Xxx IS4: [so so its four=
Xxx S1: =right and then
Xxx so there's- there's only going to be 3.
Xxx IS4: yea yea
Xxx S1: right
Xxx so this tells you where to connect it.
Xxx for instance
Xxx IS4: yea and and one
Xxx [tell
Xxx S1: [three three
Xxx IS4: one tells you ((unclear:how to command))
Xxx S1: right
Xxx 3 2 are connected for instance
Xxx IS4: 3 2 yea
Xxx S1: right so

Xxx IS4: 3 2 and
Xxx and and
Xxx S1: and it doesn’t make a difference
Xxx which one you label 1 2 3 4 right?=
Xxx IS4: =it doesn’t matter.
Xxx S1: no ok
Xxx IS4: [you you just can you know
Xxx S1: [right it's been a couple years since I done this
Xxx so it’s like- it’s like fuzzy,
Xxx IS4: uhuh
Xxx S1: but that’s ((unclear)) cause I did this
Xxx [when I did foundation
Xxx IS4: [((unclear))
Xxx S1: right
Xxx so that’s what I want to make sure
Xxx ((mumble))
Xxx this one is the same this one I'm just-
Xxx IS4: y-you can interpret into the matrix form.
Xxx S1: so so you just [make so I'm doing this
Xxx IS4: [yea
Xxx S1: this I'm doing this this I'm doing this-
Xxx just putting in matrix form.
Xxx IS4: yea
Xxx S1: ok
Xxx so for instance
Xxx IS4: so you get a 6 by 6 matrix.
Xxx S1: so yea right get a 6 by 6 [((unclear))
Xxx IS4: [6 by 6
Xxx and you can label this as 1,
Xxx A B C D E F and 1 2 3
Xxx S1: and then when it saids compute the uh-
Xxx cause this- this I'm using this one for three-
Xxx uh E.
Xxx IS4: yea
Xxx oh
Xxx this problem h- has a more complex (.) subject-
Xxx S1: yea cause you-
Xxx IS4: ((unclear)) compute the square the-
Xxx the square (of) the matrix.
Xxx S1: oh so you just multiply by itself.
Xxx IS4: yea

Xxx [multiply by itself
Xxx S1: [ok so
Xxx this create the matrix and then multiply by itself
Xxx you'll know what the answer is.=
Xxx IS4: =no no no
Xxx you ((reads something outloud))
Xxx ((math term)) do you know what this mean.
Xxx ((math term))
Xxx S1: it means um-
Xxx IS4: so (.) the there is (route) (between) A and C=
Xxx S1: =right
Xxx IS4: this
Xxx but-
Xxx S1: you- you- you can go you-
Xxx there's another way to get to C from here.
21:00
Xxx IS4: but- but you can go another way.
Xxx like A from to D and
Xxx D to C.
Xxx [so (one is two)
Xxx S1: [A to D D to C.=
Xxx =right
Xxx IS4: so it is- is ((math term))
Xxx but- but
Xxx if you go this way.
Xxx A D B C
Xxx it will be a ((math term)).=
xxx S1: =right
Xxx IS4: because there are three
Xxx S1: so [so how many points you pass <u>through</u> to get to C
Xxx IS4: [yea
Xxx S1: so you go through point D to go through point C.=
Xxx IS4: =yea so it is ((math term))
Xxx and A B C is ((math term)).=
Xxx S1: =ok so-
Xxx IS4: so in- in-
Xxx S1: ((reading, so IS4 waits))
Xxx (so if I got a two in the answer)
Xxx then I know there's two.
Xxx IS4: um:
Xxx S1: (no no not asking you for the answer)

Xxx I want to draw the graph out.
Xxx IS4: uh ((flips))
Xxx S1: so [use this one
Xxx IS4: [I think you you should read the book
Xxx S1: which ((unclear))
Xxx IS4: uh ((unclear))
Xxx example 1 part ((unclear))
Xxx S1: ok so this-
Xxx IS4: so so so you read this
Xxx you find ((unclear)) example.
Xxx S1: ok!
Xxx thank you.
Xxx because yea the biggest thing was not exactly
Xxx which way to multiply it out,
Xxx IS4: oh yea
Xxx S1: so I'm going across,
xxx and then down.
Xxx the left [matrix I’m going I’m [going across,
Xxx IS4: [so [yea
Xxx [the first matrix across
Xxx S1: [and then the second matrix going down.=
Xxx IS4: =yea
Xxx S1: ok so just and then (constructing how to)-
Xxx how to construct this.
xxx that’s where I was a little confused on.
Xxx IS4: yea
Xxx S1: alright thank you so much.
Xxx IS4: you’re welcome.